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By making imaginary exponential substitutions, or putting $\theta = 2\phi + \alpha$ and expanding, we find

$$
\begin{aligned}
I_6 &= \frac{3a^2(k^2+4)^3}{512\mathrm{k}^2}\Big[\sin\,(2\theta+2\alpha) - 8\sin\,(\theta+\alpha) + 6\theta + \tfrac{1}{3}\sin\,(3\theta+\alpha) \\
&\qquad + \sin\,(\theta+3\alpha) - 2\sin 2\theta - 4\theta\cos 2\alpha + 6\sin\,(\theta-\alpha)\Big]_{-\alpha}^{\alpha} \\
&= \frac{3a^2(k^2+4)^3}{128k^2}\big[\tfrac{14}{3}\sin\alpha\cos^3\alpha - \tfrac{17}{3}\sin\alpha\cos\alpha + \alpha(1+4\sin^2\alpha)\big] \\
&= \frac{a^2(k^2+4)}{128k^2}\big[-2k(17k^2+12) + (15k^2+12)(k^2+4)\alpha\big].
\end{aligned}
$$

Collecting results we find, since $S = I_1 - I_2 - I_3 + I_4$,

$$
\begin{aligned}
S &= \alpha\left\{\frac{9a^2(k^2+4)^2}{32k^2} + \frac{3a^2(k^2+4)(5k^2+12)}{128} - \frac{a^2(k^2+4)^2(15k^2+12)}{128k^2}\right\} \\
&\qquad + \frac{a^2}{64k}\{36(k^2+4) - 48(k^2+2) - 8k^2(k^2+4) - 9k^2(k^2+4) + (17k^2+12)(k^2+4)\} \\
&= \frac{3}{2}\frac{a^2}{k} + \tfrac{3}{4}a^2\frac{k^2+4}{k^2}\alpha = \tfrac{3}{2}ah + \tfrac{3}{4}(4h^2+a^2)\sin^{-1}\frac{a}{\sqrt{4h^2+a^2}}\cdot
\end{aligned}
$$

Also solved by G. W. HARTWELL and the PROPOSER.

398A. Proposed by EMMA GIBSON, Drury College.

[This problem was unnumbered in the December issue.]

Solve the differential equation

$$(x^3y^3 + x^2y^2 + xy + 1)y + (x^3y^3 - x^2y^2 - xy + 1)x\frac{dy}{dx} = 0.$$

SOLUTION BY FREDERICK WOOD, University of Wisconsin.

The equation

$$(x^3y^3 + x^2y^2 + xy + 1)y + (x^3y^3 - x^2y^2 - xy + 1)x\frac{dy}{dx} = 0$$

reduces to

$$(x^3y^3 + 1)(ydx + xdy) + (x^2y^2 + xy)(ydx - xdy) = 0$$

and finally to

$$x^2y^2(ydx + xdy) + ydx + xdy - 2x^2ydy = 0$$

from which we get

$$ydx + xdy + \frac{ydx + xdy}{x^2y^2} - \frac{2dy}{y} = 0.$$

This becomes, after integration,

$$xy - \frac{1}{xy} - 2\log y = c, \qquad \text{or} \qquad x^2y^2 - 2xy\log c'y = 1.$$

Also solved by H. POLISH, W. W. BEMAN, H. S. UHLER, ELIJAH SWIFT, HORACE OLSON, S. E. RASOR, G. KEULIGAN, H. L. AGARD, ELMER SCHUYLER, and B. J. BROWN.

QUESTIONS AND DISCUSSIONS.

EDITED BY U. G. MITCHELL, University of Kansas.

REPLIES.

24. The following facts are significant:

(1) The New England Association of Mathematics Teachers has appointed a committee "to investigate the current criticisms of high school mathematics."

(2) A committee of the Council of the American Mathematical Society has under consideration the question "whether any action is desirable on the part of the Society in the matter of the movement against mathematics in the schools."

(3) At the recent meeting in Cincinnati of the National Education Association an iconoclastic discussion on the topic: "Can algebra and geometry be reorganized so as to justify their